

1. Voluntary Reporting of Emission Reduction Actions: An Overview

Introduction

The Energy Policy Act of 1992 (EPACT) directed the Energy Information Administration (EIA) to develop a program to document voluntary actions that reduce emissions of greenhouse gases or remove them from the atmosphere (see box on page 2).¹ The Voluntary Reporting of Greenhouse Gases Program was developed in cooperation with the Office of Policy, U.S. Department of Energy (DOE), and with the U.S. Environmental Protection Agency (EPA). In addition to providing recognition for entities that reduce emissions or sequester carbon voluntarily, this program serves to identify innovative and effective ways to reduce greenhouse gas emissions.

To date, U.S. policy initiatives aimed at stabilizing greenhouse gas emissions have relied on voluntary approaches. President Clinton's Climate Change Action Plan² sought to identify and implement actions that could reduce emissions of greenhouse gases through an array of government/industry partnerships. Most of the reporters to the Voluntary Reporting Program are affiliated with one or more government-sponsored voluntary programs.

This report presents information on the fifth reporting cycle of the Voluntary Reporting Program, which accepted reports including information on emissions, emission reductions, and carbon sequestration activities through 1998. The report is divided into this overview and five brief sections that summarize the reports received from the following sectors: electric power (including independent power producers), industry, alternative energy providers, agriculture and forestry, and other sectors (including government, commercial, and residential entities). The appendix provides additional summary information, including lists of reporters and projects.

The reports submitted to EIA are compiled into a database that can be obtained on CD-ROM by contacting the Voluntary Reporting of Greenhouse Gases Program Communications Center at 1-800-803-5182 or downloaded from EIA's World Wide Web site at <http://www.eia.doe.gov/oiaf/1605/ftphelp.html>.

Benefits of the Voluntary Reporting Program

The Voluntary Reporting Program is unique among the many voluntary emission reduction programs initiated during the early 1990s in its diversity of project types, participation, and approaches. The Program's database provides a wealth of examples of the types of concrete actions that organizations can undertake to reduce greenhouse gas emissions. Some of the most important benefits of the Voluntary Reporting Program are as follows:³

- The program has served to teach staff at many of the largest corporations in the United States how to estimate greenhouse gas emissions and has educated them on a range of possible measures to limit emissions.
- The program has helped to provide concrete evidence for the evaluation of activities reported to the many government voluntary programs launched since 1993.
- Reporters have been able to learn about innovative emission reduction activities from the experiences of their peers.
- The program has created a "test" database of approaches to emission reductions that can be used to evaluate future policy instruments aimed at limiting emissions.

¹Title XVI of the Energy Policy Act, Public Law 102-486 (October 24, 1992), in Section 1605(a) called for an annual report on national aggregate emissions of greenhouse gases. EIA has issued the report—*Emissions of Greenhouse Gases in the United States*—every year since 1993. Section 1605(b) called for the establishment of a database on annual reductions of emissions as reported on a voluntary basis.

²U.S. Department of State, *Climate Action Report*, Publication 10496 (Washington, DC, July 1997), http://www.state.gov/www/global/oes/97climate_report/index.html.

³Testimony of Jay Hakes, EIA Administrator, before the National Economic Growth, Natural Resources, and Regulatory Affairs Subcommittee of the House Government Reform Committee about the Voluntary Reporting of Greenhouse Gases Program (July 15, 1999). The full text of the testimony is available at <http://www.eia.doe.gov/neic/speeches/htest715/testimony.htm>.

The Energy Policy Act of 1992, Sections 1605(b) and (c)

(B) Voluntary Reporting.—

- (1) ISSUANCE OF GUIDELINES.—Not later than 18 months after the date of the enactment of this Act, the Secretary shall, after opportunity for public comment, issue guidelines for the voluntary collection and reporting of information on sources of greenhouse gases. Such guidelines shall establish procedures for the accurate voluntary reporting of information on—

(A) greenhouse gas emissions—

- (i) for the baseline period of 1987 through 1990; and
- (ii) for subsequent calendar years on an annual basis;

- (B) annual reductions of greenhouse gas emissions and carbon fixation achieved through any measures, including fuel switching, forest management practices, tree planting, use of renewable energy, manufacture or use of vehicles with reduced greenhouse gas emissions, appliance efficiency, methane recovery, cogeneration, chlorofluorocarbon capture and replacement, and power plant heat rate improvement;

- (C) reductions in greenhouse gas emissions achieved as a result of—

- (i) voluntary reductions;
- (ii) plant or facility closings; and
- (iii) State or Federal requirements; and

- (D) an aggregate calculation of greenhouse gas emissions by each reporting entity.

Such guidelines shall also establish procedures for taking into account the differential radiative activity and atmospheric lifetimes of each greenhouse gas.

- (2) REPORTING PROCEDURES.—The Administrator of the Energy Information Administration shall develop forms for voluntary reporting under the guidelines established under paragraph (1), and shall make such forms available to entities wishing to report such information. Persons reporting under this subsection shall certify the accuracy of the information reported.

- (3) CONFIDENTIALITY.—Trade secret and commercial or financial information that is privileged or confidential shall be protected as provided in section 552(b)(4) of title 5, United States Code.

- (4) ESTABLISHMENT OF DATA BASE.—Not later than 18 months after the date of the enactment of this Act, the Secretary through the Administrator of the Energy Information Administration shall establish a data base comprised of information voluntarily reported under this subsection. Such information may be used by the reporting entity to demonstrate achieved reductions of greenhouse gases.

(C) Consultation.—

In carrying out this section, the Secretary shall consult, as appropriate, with the Administrator of the Environmental Protection Agency.

- The program has helped to clarify emissions accounting issues that must be addressed in designing any future approaches to emission limitations.

Who Reported?

Reports for the 1998 data year were received from 187 participants in 24 different industries or services, representing a continuing increase in both the number and diversity of participants. In comparison, reports for the 1994 data year—the first year of the program—were received from 108 participants in 9 different industries or services (Table 1).

As in previous years, most of the reporters for 1998 were actively involved in the production and distribution

of electricity; however, the dominance of voluntary reporting by the electric power sector has been steadily declining. Electric power producers accounted for 57 percent of the entities reporting for 1998, down from 88 percent for 1994 (Figure 1). In addition, the number of electric power sector reporters also declined, from 115 in 1997 to 105 in 1998. The change is attributed in part to the ongoing restructuring of the industry, which has been accompanied by several mergers and acquisitions involving reporters to the program.

Although the number of reporters for 1998 from other industries remained relatively small, in many cases reports were received from key companies in those industries: for example, General Motors in the automotive products industry, Noranda and an operating

Table 1. Forms Filed by Standard Industrial Classification, Data Years 1994-1998
(Number of Reports)

SIC Code	Description	Data Year				
		1994	1995	1996 ^(R)	1997 ^(R)	1998
01	Agricultural Production: Crops	0	0	0	0	1
08	Forestry.	1	2	1	1	3
12	Coal Mining.	1	2	2	1	4
14	Nonmetallic Minerals, Except Fuels	0	0	0	0	1
20	Food and Kindred Products	0	0	0	0	1
27	Printing and Publishing.	0	1	0	1	0
28	Chemical and Allied Products	1	3	2	3	5
29	Petroleum Refining and Other Related Industries	0	0	2	3	7
32	Stone, Clay, Glass, and Concrete Products	0	0	2	4	5
33	Primary Metals	2	2	4	4	5
34	Fabricated Metal Products, Except Machinery and Transportation Equipment	0	2	1	1	3
36	Electronic Equipment.	1	1	2	4	4
37	Transportation Equipment	1	1	1	2	3
38	Instruments and Related Products	0	0	0	0	1
39	Miscellaneous Manufacturing Industries	0	1	1	0	2
49	Electric, Gas, and Sanitary Services	98	123	125	129	132
57	Furniture and Home Furnishings Stores	0	0	0	0	1
65	Real Estate.	0	1	1	1	1
67	Holding and Other Investment Offices	0	0	1	1	1
80	Health Services.	0	0	0	0	1
82	Educational Services.	1	2	2	2	0
86	Membership Organizations.	0	0	0	1	1
87	Engineering and Management Services	0	0	2	2	2
88	Private Households.	2	1	1	1	1
89	Services Not Elsewhere Classified.	0	0	0	1	1
91	Executive, Legislative, and General	0	0	0	0	1
Total		108	142	150	162	187

(R) = revised.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

division of Alcan in the metals industry, Consol and Peabody in the coal mining industry, BP Amoco in the petroleum industry, Johnson & Johnson and The Dow Chemical Company in the chemicals industry, and IBM and Motorola in the electronic equipment industry. A complete listing of all reporters is provided in Table A1 of the Appendix.

Most reporters indicated that their projects were affiliated with one or more government-sponsored voluntary programs. Of the 1,507 projects reported for 1998, 952 were affiliated with the Climate Challenge Program, 94 with the Climate Wise Recognition Program, 94 with the Landfill Methane Outreach Program, 34 with the U.S. Initiative on Joint Implementation, 24 with EPA's Green Lights Program, 12 with Energy Star Buildings, 9 with the Coalbed Methane Outreach Program, and 5 with the Natural Gas STAR Program. Other voluntary programs cited included Energy Star Computers, Energy Star

Transformers, the Voluntary Aluminum Industrial Partnership, Motor Challenge, WasteWiSe, and the Cool Communities Program. Not all participants in the various voluntary programs provided information to the Voluntary Reporting Program.

What Was Reported?

The Voluntary Reporting Program permits three distinct types of reporting:

- Project-level emissions and reductions, defined as the emission reductions consequences of a particular action
- Entity-level emissions and reductions, defined as the emissions and reductions of an entire organization, usually defined as a corporation
- Commitments to take action to reduce emissions in the future.

Most reporters (176) reported project-level reductions, and 65 reported entity-level emissions and/or reductions. As the numbers imply, most (54) of the reporters that reported entity-level emissions also reported project-level emissions. One hundred twenty-two organizations submitted only project-level reports, whereas 11 reported only entity-level information. Sixty-seven reporters provided information on their commitments to reduce emissions or increase sequestration in the future.

Project Level

Of the 187 reporters, 176 (94 percent) provided information on a total of 1,507 projects (Table 2). The total number of projects reported increased by 219, or 17 percent, compared with the previous reporting cycle.⁴ The electric power sector, which includes regulated electric

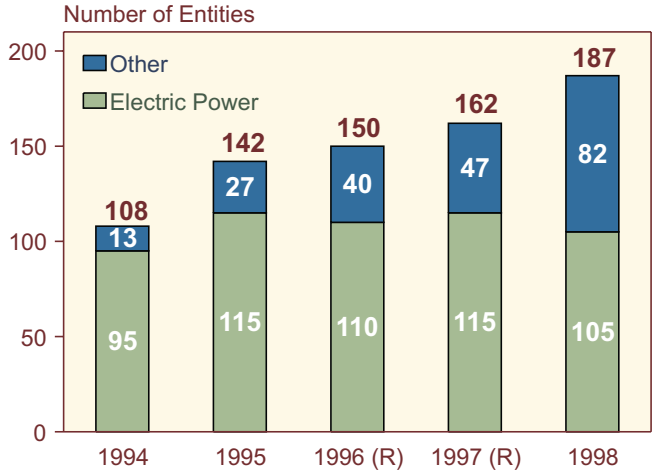
utilities and independent power producers (IPPs), accounted for three-quarters of the projects reported. The industrial, agriculture and forestry, and alternative energy sectors each reported between 7 and 8 percent of the projects. Entities in other sectors (government, commercial, and residential) reported 26 projects (2 percent). Most projects involve actions within the United States; however, some are foreign based, designed to test various concepts of joint implementation with other nations (Table 3). Fifty-six of the 83 foreign projects represent shares in two forestry programs in Belize and Malaysia sponsored by the U.S. electric utility industry.

Most of the emission reductions (76 percent of the carbon dioxide equivalent) reported for 1998 were reported by electric power sector entities (Table 4). Alternative energy providers were responsible for 17 percent of the total carbon dioxide equivalent reported, followed by industry (5 percent), agriculture and forestry (1 percent), and other (1 percent). Carbon dioxide accounted for 79 percent of the emission reductions reported on a carbon dioxide equivalent basis. Reported reductions of other gases included methane (19 percent), perfluorocarbons (PFCs) (2 percent), and sulfur hexafluoride (SF₆) and nitrous oxide (N₂O) (less than 1 percent each) (Table 5). The reports received for 1998 reflect a net increase in hydrofluorocarbon (HFC) emissions resulting from their use as substitutes for chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).

Entity Level

Most of the 65 reporters providing entity-level information included data on both emissions and emission reductions or sequestration. Three reporters (Central and South West Corporation, Columbia Falls Aluminum Company, and The Gillette Company) provided data on emissions only. Three reporters (Commonwealth Bethlehem Energy, Seattle City Light, and World Parks Endowment) provided data on emission reductions or sequestration only.

Figure 1. Electric Power Sector and Other Entities Submitting Reports to the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-1998



(R) = revised.
Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

Table 2. Distribution of Projects by Sector, Data Year 1998

Sector	Number of Projects	Number of Reporters
Electric Power	1,147	105
Alternative Energy Providers	102	33
Agriculture and Forestry	112	6
Industry	120	35
Other (Government, Commercial, and Residential)	26	8
Total	1,507	187

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

⁴The number of projects reported for 1997 has increased from 1,229 to 1,288 with the receipt of several additional reports after, and revision of reports that had not been accepted by, the time the database was used to prepare the 1997 annual report and Public Use Database. See note to Table 3.

Table 3. Geographic Scope of Reports Received and Location of Emission Reduction Projects, Data Years 1994-1998

Geographic Scope	Reports Received					Projects Reported				
	1994	1995	1996 ^(R)	1997 ^(R)	1998	1994	1995	1996 ^(R)	1997 ^(R)	1998
U.S. Only	102	124	125	130	147	636	931	1,007	1,216	1,424
Foreign Only	2	2	1	1	1	9	36	33	72	83
Both U.S. and Foreign . .	4	16	24	31	39	NA	NA	NA	NA	NA
Total	108	142	150	162	187	645	967	1,040	1,288	1,507

NA = not applicable.

(R) = revised.

Note: The number of reports received and number of projects reported for 1996 and 1997 were revised to reflect the receipt of reports after the finalization of the Public Use Database for last year's annual report. For 1997, 6 additional reports were received from Cinergy, Arizona Portland Cement Company, California Portland Cement Co.—Colton Plant, California Portland Cement Co.—Mojave Plant, Delta Electric Power Association, and DuPont Company. For 1996, Taunton Municipal Lighting Plant submitted a report with information on four projects. The numbers of projects reported for 1996 and 1997 have also been revised to include the additional projects reported, as well as revisions to reports that were not finalized in the 1997 Public Use Database.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

Table 4. Summary of Project-Level Emission Reductions by Sector, Data Year 1998
(Metric Tons Carbon Dioxide Equivalent)

Gas	Reductions by Sector					Total Reductions
	Electric Power	Alternative Energy	Agriculture and Forestry	Industry	Other	
Carbon Dioxide	149,517,578	9,242,245	2,046,935	4,658,554	1,113,881	166,579,193
Methane	10,342,413	27,823,400	33,072	1,427,282	1,256,555	40,882,722
Nitrous Oxide	131,685	93,649	—	—	—	225,334
HFCs	-1,738	—	—	—	—	-1,738
PFCs	6,536	—	—	3,770,560	—	3,777,097
SF ₆	574,421	—	—	—	—	574,421
Total	160,570,896	37,159,293	2,080,007	9,856,397	2,370,437	212,037,029
CFCs, HCFCs	36,767	—	—	1,248,173	—	1,284,940

Notes: Totals include all nonconfidential emission reductions reported. No attempt has been made to correct for double counting, where more than one entity may have reported on the same emission reduction project. CFCs and HCFCs are not included in the totals because of the uncertainty associated with estimates of their net global warming potential. Their direct warming effects (positive radiative forcing) are offset by indirect cooling effects (destruction of stratospheric ozone, another greenhouse gas). The values shown for CFCs and HCFCs reflect direct warming effects only. Emission reductions include increases in carbon sequestration.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

Table 5. Summary of Project-Level Emission Reductions, Data Years 1994-1998
(Metric Tons Carbon Dioxide Equivalent)

Gas	1994	1995	1996	1997	1998
Carbon Dioxide	6,217,993	118,634,468	116,922,967 ^(R)	124,657,268 ^(R)	166,579,193
Methane	3,197,079	23,861,796	34,015,736	20,233,935 ^(R)	40,882,722
Nitrous Oxide	584,811	200,752	201,580	197,869 ^(R)	225,334
PFCs	3,448,668	3,192,463	3,604,265	3,673,641	3,777,097
Other Gases	89,950	208,850	-57,569 ^(R)	556,345	572,683
Total	73,538,501	146,098,329	154,686,979 ^(R)	149,319,058 ^(R)	212,037,029
CFCs, HCFCs, and Methyl Chloroform . .	357,919	20,467,843	2,478,691	80,864	1,284,940

(R) = revised.

Notes: Totals include all nonconfidential emission reductions reported. No attempt has been made to correct for double counting, where more than one entity may have reported on the same emission reduction project. "Other Gases" includes SF₆ and HFCs. CFCs and HCFCs are not included in the totals because of the uncertainty associated with estimates of their net global warming potential. Their direct warming effects (positive radiative forcing) are offset by indirect cooling effects (destruction of stratospheric ozone, another greenhouse gas). For the same reason, methyl chloroform has been excluded from the "Other Gases" category. The values shown for CFCs, HCFCs, and methyl chloroform reflect direct warming effects only. Totals may not equal sum of components due to independent rounding. Emission reductions include increases in carbon sequestration.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

Total entity-level emissions of carbon dioxide reported for 1998 were 1,481.2 million metric tons, which represents a 5-percent increase over the emissions reported for 1997 (Table 6). Seventy percent of the reported carbon dioxide emissions were from direct sources (i.e., stacks or exhaust pipes owned by the reporter), almost all (99.7 percent) of which were from stationary combustion. Thirty-five reporters also reported emissions of carbon dioxide from indirect sources, which are sources that are owned by other entities but over which the reporter exerts some influence. Most (33) of those reports were for emissions associated with purchased electricity; however, more than three-quarters of the total amount of indirect carbon dioxide emissions reported were emissions from motor vehicles manufactured by General Motors Corporation and reported by the company.

Entity-level emissions of gases other than carbon dioxide were reported by 18 reporters for 1998. The carbon dioxide equivalent of the emissions of these gases was 52.5 million metric tons, with methane and nitrous oxide accounting for 92 percent of the total (Table 7). Other gases reported included HFCs (HFC-23 and HFC-134a), PFCs (perfluoroethane and perfluoromethane), and SF₆. Emissions of gases that have indirect effects on global warming and for which accepted global warming potential indices (GWPs) are not available were also reported for 1998, including CFCs, HCFCs, halons, methylene chloride, chloroform, carbon tetrachloride, methyl chloroform, carbon monoxide, nitrogen oxides (NO_x), and volatile organic compounds (VOCs).

Reported reductions in carbon dioxide emissions and increases in carbon sequestration reported at the entity

Table 6. Total Entity-Level Carbon Dioxide Emissions Reported in Data Year 1998 by Type of Activity, 1990-1998
(Million Metric Tons Carbon Dioxide)

Type of Emission	1990	1991	1992	1993	1994	1995	1996	1997	1998
Direct Emissions									
Stationary Combustion	859.7	610.1	713.3	746.4	830.2	856.4	871.9	929.6	1,033.6
Transportation	2.7	0.2	0.2	0.2	0.6	0.6	0.7	0.6	1.0
Other Direct Sources	1.2	1.4	1.4	1.7	1.9	2.0	2.5	2.5	2.5
Total Direct	863.6	611.7	714.9	748.3	832.7	859.0	875.1	932.7	1,037.1
Indirect Emissions									
Purchased Power	71.4	63.1	61.8	69.7	70.4	74.4	90.2	118.3	96.4
Other Indirect Emissions	377.7	368.9	372.3	372.4	373.6	368.1	361.0	354.0	347.6
Total Indirect	449.1	432.0	434.1	442.2	444.0	442.5	451.2	472.3	444.1
Total^a	1,312.7	1,043.7	1,149.0	1,190.5	1,276.7	1,301.5	1,326.3	1,405.0	1,481.2
Electricity Wholesaling	17.4	12.6	6.6	5.6	3.0	4.4	-6.5	-48.9	-31.8

^aTotal emissions represent the sum of total direct emissions, emissions from purchased power, and other indirect emissions. The totals may not equal the sum of the total emissions reported in Part IVa of Form EIA-1605, because the totals calculated by some utility reporters reflect net emissions from purchased power and electricity wholesaling.

Source: Energy Information Administration, Form EIA-1605.

Table 7. Total Entity-Level Emissions of Greenhouse Gases Other than Carbon Dioxide Reported in Data Year 1998 by Type of Gas, 1990-1998
(Million Metric Tons Carbon Dioxide Equivalent)

Gas	1990	1991	1992	1993	1994	1995	1996	1997	1998
Methane	51.2	13.6	14.1	10.8	27.4	27.8	24.8	26.2	28.8
Nitrous Oxide	18.2	19.0	19.9	20.7	21.4	21.3	20.8	20.2	19.5
Hydrofluorocarbons	*	*	*	0.2	0.8	1.3	1.8	2.3	2.9
Perfluorocarbons	1.7	0.8	0.8	0.7	1.0	0.8	0.7	0.7	0.5
Sulfur Hexafluoride	NR	0.1	0.1	0.1	1.1	1.4	1.4	1.0	0.8
Total Emissions	71.0	33.5	34.9	32.6	51.6	52.6	49.4	50.4	52.5

*Less than 0.05 million metric tons.

NR = no emissions reported.

Source: Energy Information Administration, Form EIA-1605.

level totaled about 150 million metric tons carbon dioxide equivalent in 1998 (Table 8). Seventy-one percent of the total was attributed to stationary combustion sources. The other principal sources of carbon dioxide emission reductions included purchased power (6.5 percent), other indirect sources (14.8 percent), and sinks and sequestration (7.4 percent).

Reported net reductions in entity-level emissions of gases other than carbon dioxide were 27 million metric tons carbon dioxide equivalent for 1998. Reductions in methane and nitrous oxide emissions accounted for 87 percent and 10 percent of the total, respectively. Reductions in perfluorocarbons and sulfur hexafluoride were also reported. A reported net increase in hydrofluorocarbon emissions was attributed to increased production and use of HFCs as substitutes for CFCs and HCFCs. Reductions were also reported for several gases that have indirect effects on global warming and for which accepted GWPs are not available, including CFCs, HCFCs, halons, carbon tetrachloride, methyl chloroform, carbon monoxide, NO_x, VOCs, and non-methane volatile organic compounds (NMVOCs).

Commitments

Sixty-seven entities reported commitments to reduce future emissions, to take actions to reduce emissions in the future, or to provide financial support for activities related to greenhouse gas reductions. Most (75 percent)

of the commitments were reported by electric utilities participating in the Climate Challenge Program. The 14 nonutilities reporting commitments were participants in one or more of the following voluntary programs: Climate Wise, WasteWiSe, the Voluntary Aluminum Industrial Program, and the Landfill Methane Outreach Program.

There are three forms of future commitment in the Voluntary Reporting Program: entity commitments, financial commitments, and project commitments. Entity and project commitments roughly parallel the entity and project aspects of emissions reporting: an entity commitment is a commitment to reduce the emissions of an entire organization; a project commitment is a commitment to take a particular action that will have the effect of reducing the reporter's future emissions. A financial commitment is a pledge to spend a particular sum of money on activities related to emission reductions, without a specific promise as to the consequences of the expenditure.

Twenty-nine firms made 43 specific promises to reduce, avoid, or sequester future emissions at the corporate level. As in the case of entity reporting, some commitments were to reduce emissions below a specific baseline, others to limit the growth of emissions per unit of output, and others to limit emissions by a specific amount by comparison with a baseline emissions growth trend. In their reports for 1998, companies

Table 8. Total Entity-Level Carbon Dioxide Emission Reductions Reported in Data Year 1998 by Type of Activity, 1991-1998
(Million Metric Tons Carbon Dioxide)

Type of Reduction	1991	1992	1993	1994	1995	1996	1997	1998
Direct Reductions								
Stationary Combustion	26.2	48.0	52.1	68.7	92.1	99.0	97.9	107.2
Transportation	*	*	*	0.1	0.1	0.1	*	*
Other Direct Sources	NR	*	0.1	0.3	0.6	0.8	0.9	1.0
Total Direct	26.2	48.0	52.2	69.0	92.8	99.9	98.8	108.2
Indirect Reductions								
Purchased Power	4.9	2.6	4.9	1.6	3.6	3.8	5.1	9.9
Other Indirect Sources								
Integrated Waste Services Association	NR	NR	NR	NR	15.8	16.5	16.0	16.1
All Other Reporters	0.5	0.8	1.4	3.9	5.1	6.4	4.5	6.5
Total Indirect	5.4	3.4	6.3	5.5	24.5	26.7	25.5	32.4
Carbon Sequestered	3.1	4.7	8.7	8.8	9.6	9.7	10.8	11.2
Total Reported Reductions^a	34.7	56.1	67.3	83.3	126.8	136.3	135.2	151.8
Electricity Wholesaling	5.5	7.4	6.8	8.3	6.6	6.5	4.9	2.8

^aTotal reductions represent sum of reductions in total direct emissions, emissions from purchased power, and other indirect emissions. The totals may not equal the sum of the total reductions reported in Part IVa of Form EIA-1605, because the totals calculated by some utility reporters reflect net emissions from purchased power and electricity wholesaling.

*Less than 0.05 million metric tons.

NR = not reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Form EIA-1605.

committed to reducing future emissions by a total of 96.5 million metric tons carbon dioxide equivalent.

Thirty-eight companies reported on commitments to undertake 266 individual emission reductions projects. Some of the commitments were linked to future results from projects already underway and forming part of the reporters' submissions. Others were for projects not yet begun. Reporters indicated that the projects were expected to reduce future emissions by 85 million metric tons carbon dioxide equivalent, most of which (76 million metric tons) would be reductions of carbon dioxide.

Twenty-nine firms made financial commitments. The total amount of funds promised was \$42 million, of which \$12 million was reported actually to have been expended in 1998.

Status of Policy Initiatives

In October 1997, the Administration proposed to reward organizations taking early, voluntary action to reduce greenhouse gas emissions.⁵ Several groups have proposed alternative programs that would offer credits for early emission reductions. In October 1998, the President's Council on Sustainable Development published a description of "principles" for a credit for early action bill.⁶ In this year's State of the Union Address, President Clinton reaffirmed his support for rewarding companies that take early, voluntary action to reduce greenhouse gases.⁷

Several bills dealing with credit for early action or voluntary reporting have been introduced in the current session of Congress. In March 1999, Senators Chafee (R-RI), Lieberman (D-CT), and Mack (R-FL) reintroduced the Credit for Voluntary Reductions Act with several additional cosponsors. The bill is a modified version of one that was introduced last year that would authorize the President to enter into agreements to provide regulatory credit for voluntary early action to mitigate greenhouse gas emissions.⁸ The current bill proposes to provide credit, usable in a possible future domestic regulatory program that would limit greenhouse gas emissions, for voluntary actions taken before such a regulatory program comes into effect. The proposed legislation provides that an "early action agreement"

between the U.S. Government and an organization "may provide that a participant shall be entitled to receive" credits for reductions reported to the Voluntary Reporting Program for the period 1991-1998 if the report was received before January 1, 1999, and the reporter provided "information sufficient to verify, to the satisfaction of the President . . . that actions reported . . .

- (A) have been accurately reported;
- (B) are not double-counted; and
- (C) represent actual reductions in greenhouse gases or actual increases in net carbon sequestration."⁹

A modified version of the Chafee bill was introduced into the House of Representatives by Rep. Lazio (R-NY) and 12 others in July 1999.¹⁰ The Lazio bill differs from the Chafee bill in the following ways:

- It requires that all submissions be certified by a qualified third-party auditor.
- It includes detailed requirements for calculating credits by manufacturers and adopters of end-use, consumer, and similar technologies using a reference case (baseline emissions) adjusted for changes in the manufacturer's production and overall performance of the economy.
- It includes provisions addressing the calculation of credits for increases in domestic carbon stocks through forestry initiatives.

The credit for early or voluntary action initiatives have been countered by proposed legislation that would continue to rely on voluntary initiatives to reduce emissions and sequester carbon. In April 1999, Senators Murkowski (R-AK), Hagel (R-NE), Byrd (D-WV), and seven others introduced the Energy and Climate Policy Act of 1999 (S. 882), which would amend EPACT to:

- Develop a program of public recognition for those entities that have achieved certified greenhouse gas reductions
- Conduct a review of potential changes to the guidelines for Voluntary Reporting Program, including establishing a random verification process, developing a range of reference cases, addressing double reporting issues, and finding ways to facilitate the

⁵Office of the Press Secretary, The White House, "Press Briefing by Chair of the National Economic Council Gene Sperling, Assistant to the President for International Economic Policy Dan Tarullo, Deputy National Security Advisor Jim Steinberg, Staff Secretary Todd Stern, Chair of Council on Environment Quality Katie McGinty, and Deputy Secretary of Treasury Larry Summers" (Washington, DC, October 22, 1997), <http://www.pub.whitehouse.gov/uri-res/I2R?urn:pdi://oma.eop.gov.us/1997/10/30/9.text.1>.

⁶President's Council on Sustainable Development, Climate Task Force, *Principles for Early Action* (Washington, DC, October 27, 1998), <http://www2.whitehouse.gov/PCSD/tforce/cctf/cfprinc.html>.

⁷President William Jefferson Clinton, State of the Union Address, January 19, 1999 (Background Materials), <http://www.whitehouse.gov/WH/SOTU99/climate.html>.

⁸"Credit for Voluntary Reductions Act," S. 547, 106th Congress (March 4, 1999), <http://thomas.loc.gov>.

⁹"Credit for Voluntary Reductions Act," S. 547, 106th Congress (March 4, 1999), Section 5(d)(2), <http://thomas.loc.gov>.

¹⁰"Credit for Voluntary Reduction Act," H.R. 2520, 106th Congress (July 14, 1999), <http://thomas.loc.gov>.

participation of farmers and small businesses (in consultation with the U.S. Department of Agriculture and the Small Business Administration)

- Revise the guidelines for the Voluntary Reporting Program to incorporate changes found to be beneficial and cost-effective in improving the accuracy and reliability of the reported greenhouse gas reductions and related information.

In November 1999, Rep. Barton (R-TX) introduced a version of the Murkowski bill in the House of Representatives as two separate bills.¹¹

Consideration of the proposal by the 106th Congress may lead to other proposals or amendments, and there can be no current assurance of the final content or ultimate passage of any legislation. Nevertheless, the experience of the Voluntary Reporting Program can inform debate on legislative initiatives.

“Credit for Early Action” and Voluntary Reporting

The interest in credit for early action has generated evaluations of EIA’s Voluntary Reporting Program as a possible vehicle for providing regulatory credit. By design, however, the program is primarily a registry for claims of reductions, rather than an emissions trading program or a credit for early reductions program. Constructing a set of reporting rules that would govern the preparation of comparable, verifiable, auditable reports of emissions and emission reductions would require finding answers to a number of complex questions (see box on pages 10-11), including the following:

- Who can report?
- What is a reduction?
- Who owns the reduction?
- Would the reduction have occurred without the reported action?
- How can reports be verified?

Because neither DOE nor EIA has attempted to resolve these questions, it is possible for the same company to report its emissions and reductions in several different ways, and for more than one reporter to claim the same reduction. Some commentators on the Voluntary Reporting Program have characterized this aspect of the program as a defect: a problem needing a solution. On the other hand, for the following reasons it can be viewed as a useful attribute of the program:

- The educational and public recognition aspects of the program do not require a complete and fully defined system of baselines, accounting rules, and property rights.
- The Voluntary Reporting Program can be viewed as a survey of emission accounting methods and theories actually in use and a set of illustrations of the potential accounting and baseline problems that must be confronted in designing future policy instruments. A more structured approach would have been less useful for identifying and analyzing accounting issues.
- The program’s database illustrates the range and diversity of concrete actions that firms can undertake to limit greenhouse gas emissions, including many not imagined by the designers of the program. A more structured approach might have excluded some of the more original and innovative projects reported to the program.

These features make the Voluntary Reporting Program useful for evaluating the design and consequences of any proposed credit for early action program. By creating a database of real-world emission reduction actions and actors, the data reported to the Voluntary Reporting Program can be used to gain insight into the incentive effects and beneficiaries of various credit for early action proposals. The database also provides a mechanism for identifying some of the issues that would have to be resolved in developing an accounting system for an effective credit program.

¹¹“Energy and Climate Policy Act of 1999,” H.R. 3384, and “A bill to strengthen provisions in the Federal Nonnuclear Energy Research and Development Act of 1974 with respect to potential Climate Change,” H.R. 3385, 106th Congress (November 16, 1999), <http://thomas.loc.gov>.

Accounting Issues Raised by Voluntary Reporting

The Voluntary Reporting Program has been a laboratory for identifying and evaluating some of the accounting issues that would have to be resolved in the implementation of a program to provide credits for early or voluntary actions to reduce greenhouse gas emissions.^a The issues revolve around definition, ownership, and verification of claimed reductions and are reflected in the following questions:

Who Can Report?

EPACT Section 1605(b) mentions only “entities” and “persons” as prospective reporters. Several overlapping concepts of “who can report” surfaced at the public hearings on guidelines for the Voluntary Reporting Program, all of which were accommodated. Effectively, the following “reporters” are eligible under the program guidelines:

- A legal person (i.e., an individual, household, corporation, or trade association). Emissions and reductions are calculated and reported at the corporate level.
- A facility or group of facilities. Emissions and reductions are calculated as those of a particular facility, defined as a single plant in a specified location, or perhaps even a single stack within a plant. A corporation or legal person acquires responsibility for emissions and reductions through ownership of one or more specified facilities.
- A “project” or activity. Reductions are defined by comparing the emissions from some set of relevant sources with an estimate of what emissions would have been if a particular action or group of actions had not been undertaken.

What is a Reduction?

The most intuitive definition of a reduction is one measured against a historical baseline or “basic reference case.” In this approach, the reduction is defined as the difference between the emissions of an entity or facility in a prior, baseline year (usually 1990) and the current year. This approach is best suited to reporters whose activities have not appreciably changed since the baseline year. It presents particular problems for firms that have participated in mergers, acquisitions, or divestitures or have made significant changes in the composition of their business. Startup companies or new facilities that have no history cannot use historical

baselines. The historical baseline approach is also not well suited to measuring the reductions achieved by projects, which often are entirely new activities with no history.

Alternatively, many reporters define their reductions by comparison with what would have happened in the absence of a specified set of actions. Thus, corporate emissions may have risen, but they are less than they would have been in the absence of corporate action. This approach is called, in the Voluntary Reporting Program, a “modified reference case” or “hypothetical baseline.”

The “unit of production” approach is a variant of the fixed historical baseline, where the reporter normalizes baseline emissions to reflect changes in production. If emissions per unit of output have declined, either by comparison with levels in a prior year or with what they would have been in the absence of some actions, then the reporter has a reduction. This approach works reasonably well for organizations that have a well-defined product that is homogenous across companies and over time: for example, kilowatthours generated or sold, tons of steel, or barrels of crude oil. As products increase in complexity, however, this approach gradually breaks down. Tons of semiconductors, for example, is a meaningless measure of output.

The alternative measures of reductions have their advantages and disadvantages. Basic reference cases are objective and relatively easily verifiable. On the other hand, absolute reductions are often the product of circumstance rather than action. Modified reference cases explicitly measure the results of actions, but they are more difficult to verify. Unit-of-production reference cases are useful only in a limited number of cases, and they can combine some of the disadvantages of both basic and modified reference cases.

Who Owns the Reduction?

Two theories of emissions ownership coexist in the Voluntary Reporting Program. The most intuitive, and commonplace, is “direct emissions” and “direct reductions.” If a reporter owns or uses (e.g., leases) the emission source, he owns the emission as well as any reductions from the source. The advantage of limiting ownership to direct emissions is that it generally

(continued on page 11)

^aThis discussion is a synopsis of testimony given by Jay Hakes, EIA Administrator, before the National Economic Growth, Natural Resources, and Regulatory Affairs Subcommittee of the House Government Reform Committee about the Voluntary Reporting of Greenhouse Gases Program. The full text of the testimony is available at <http://www.eia.doe.gov/neic/speeches/htest715/testimony.htm>.

Accounting Issues Raised by Voluntary Reporting (Continued)

prevents multiple ownership of the same emission or reduction. This approach excludes many important emission reduction methods, however, including all activities that tend to reduce electricity consumption, activities of energy service companies, and provision of energy-efficient or emission-reducing capital goods.

The alternative theory of ownership is based on causation: if an organization causes an emission or reduction, it is responsible for that emission, even if it does not own the emission source. Emissions or reductions from sources not owned by the reporter are referred to as “indirect.” The most important example of indirect emissions is those produced through the consumption of electricity. If entities reduce their consumption of electricity, they cause their electric utility to reduce its emissions. This approach permits reporting of any action that has an influence on national emissions. However, the concept of “causing an emission” is inherently more ambiguous than “owning the smoke stack,” and in many cases more than one firm may credibly claim to have helped cause an emission or reduction. EIA requires that reporters explicitly identify all emissions and reductions as either direct or indirect so that potentially double-counted reductions can be identified.

Would the Reduction Have Occurred Without the Reported Action?

This issue is often discussed in other contexts under the term “additionality.” It has been suggested that many emission reduction projects do not represent “real” reductions because they would have been undertaken “anyway” in the normal course of business. Creating an operational definition of additionality would be

difficult, however, because the “normal course of business” is a hypothetical concept. For the purposes of voluntary reporting—which include publicizing the types of actions that limit national greenhouse gas emissions and providing recognition for the companies that undertake the actions voluntarily—determining the additionality of projects is unnecessary. For the purposes of a credit for early reduction program, additionality is an issue that needs to be considered.

How Can Reports Be Verified?

DOE decided not to require independent verification of emission reductions reported to the Voluntary Reporting Program after considering the issue during the development of the guidelines for the program; however, reporters must certify the accuracy of their 1605(b) reports.^b

In general, reports submitted to EIA are factually accurate. Meaningful verification of the accuracy of 1605(b) reporting would require putting in place common baselines and accounting standards that would limit the scope for the application of judgment in preparing and reviewing claims of emission reductions. For example, if the accounting treatment for indirect emissions from electricity purchases is undefined, then a particular set of facts about a reporter could result in two different estimates of emissions: one including electricity purchases and one excluding electricity purchases. A third-party verifier could verify the facts about the reporter but would not be able to determine whether indirect emissions from electricity purchases ought to be included and, consequently, could not determine whether the total emissions reported were correct or not.

^bAlso, filing a false statement on a U.S. Government form is illegal.